

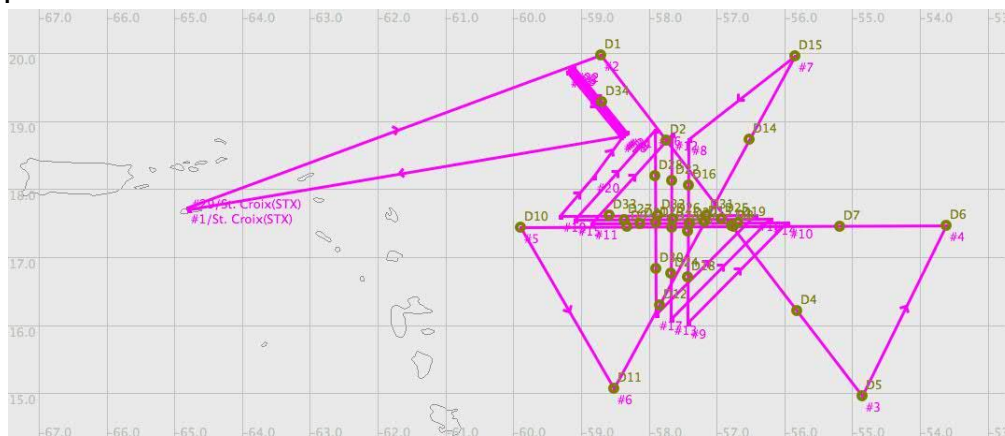
## Platform Scientist Report for August 29, 2010

DC8 Platform Scientists: Scott Braun and Jon Zawislac

FLL Mission Scientists: Jeff Halverson and John Molinari

### August 29, 2010

**Mission Objective:** This mission was the first of two involving a suitcase flight to Saint Croix to conduct missions into Hurricane Earl, with the goal of investigating rapid intensification. Specific objectives were to (1) To provide a broad-scale survey of the storm and its near environment; (2) execute a series of three non-rotated figure 4 patterns; and (3) execute a dust model that combines data from LASE and large at multiple levels .



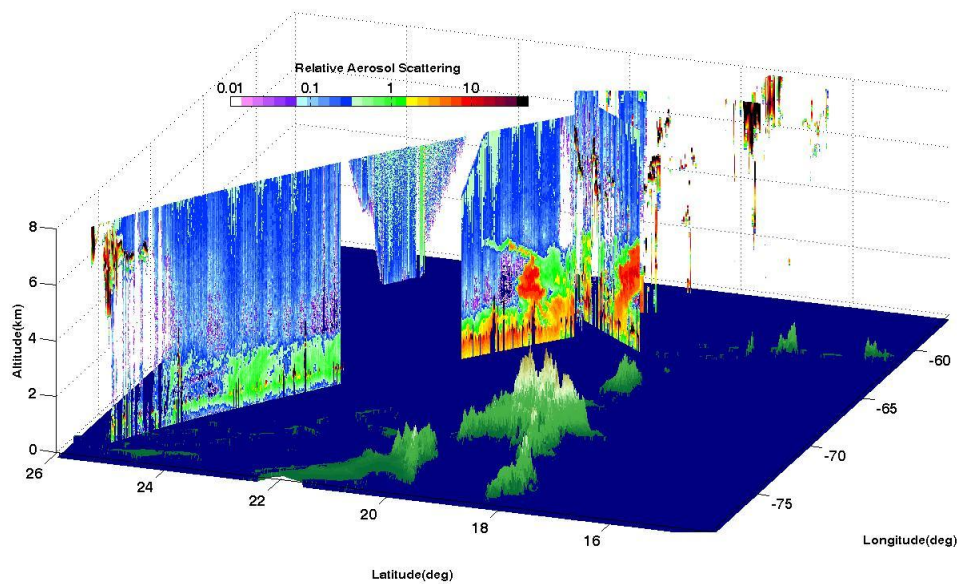
After a ferry flight to Saint Croix on Saturday, Aug. 28, the DC8 was scheduled to depart for Earl on Aug. 29 at 14 UTC. The takeoff was delayed by 2.5 h due to a bird being sucked into the engine during taxi to the runway. No damage to the engine occurred. The DC8 took off at 1630 UTC heading to the northwestern side of Earl to begin a broad survey of the storm. The storm had just recently (15 UTC) become a hurricane with maximum winds of about 65 knots and a minimal central pressure of 985 mb. The first leg headed through the center heading toward the southeast of the storm. Somewhat contrary to expectations, only a relatively small amount of dust was evident during this pass on the northwestern side of the eyewall. The eye was cloudy at flight level (and throughout the flight), with no reflectivity echoes appearing on the pilot's radar. Tracking of the center was difficult because of its lack of definition in satellite data and the lack of or late arrival of satellite data into the onboard RTMM system. Frequent bursts of lightning in the eyewall convection were observed, particularly on the western to southern portions of the eyewall. After the second pass through the storm, heading from east to west, the westward leg was terminated early because of intense lightning in a well-defined outer rainband on the western and southern sides of the storm. The aircraft turned southward and

then northward to begin a south-to-north transect of the storm, again passing through the center. The northern end of this line was also terminated early due to intense lightning activity.

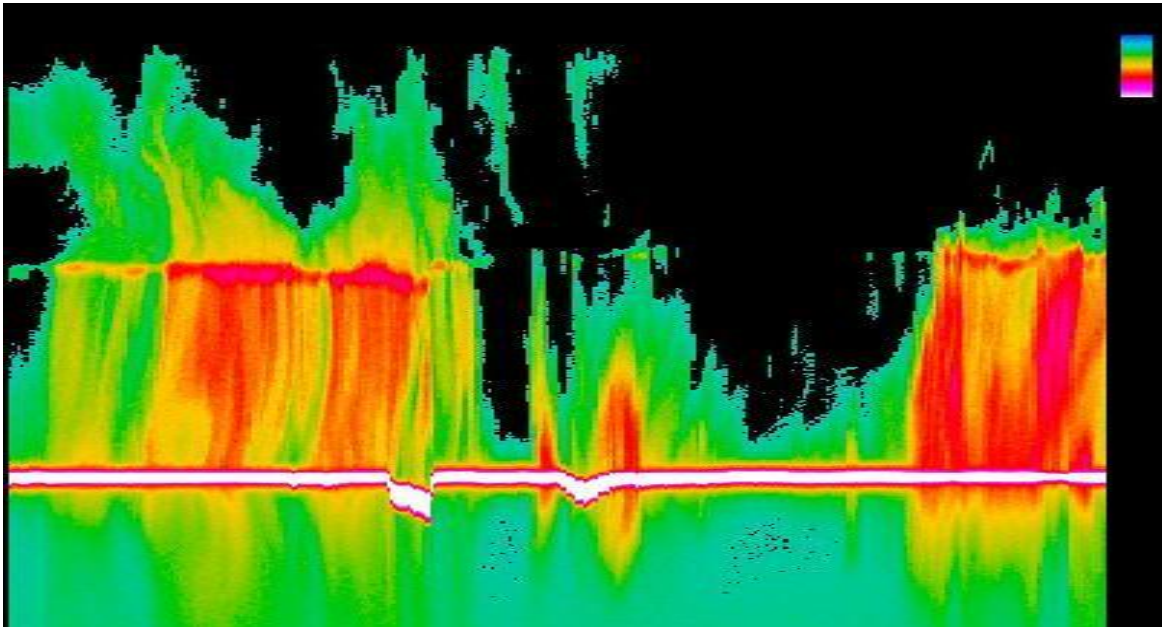
Following a turn to the south, we were set to begin the set of figure 4 patterns. However, intense lightning and reflectivities were observed in the eyewall of Earl as we approached the eyewall and the pilot deviated around this convection just outside the western side of the eyewall, preventing a pass through the eye. The remainders of two figure 4 patterns were completed without major difficulty, the only problem being the difficulty of detecting the exact center of the storm. Many of the dropsondes in the eye were associated with strong winds, suggesting that they fell along the inner edge of the eyewall. Shortly after the flight (00 UTC Aug. 30), the storm intensity had increased to 75 knots and 972 mb.

By this time, it was apparent that conditions in St. Croix were deteriorating, so the decision was made to return to Fort Lauderdale, thus necessitating a shortening of the planned on-station time. This reduction was accomplished by dropping the third figure 4 pattern and limiting the dust module to only two levels. In the end, the dust module was cancelled due to limited dust and rapid melting of ice in the interior of the plane during descent (the ice formed partly as a result of the high heat and humidity in the plane at takeoff). The return to FLL meant that part of the DC8 ground crew was left behind in St. Croix. Flight duration was approximately 10 h.

The PIP failed during the mission. LASE and DAWN collected good data in the environment of the storm, but otherwise collected little data in the interior. An example of LASE aerosol data during two transects to the north and west of the storm is shown below. Unfortunately, we were unable to get to lower altitudes during the attempted dust module for LARGE to get data in the dust layer.



MMS, APR2, and dropsonde collected excellent data. The APR2 image below shows the storm structure during the southbound eye crossing at 2056 UTC, with heavy stratiform precipitation on the northern side and shallower (only up through the freezing level) but intense precipitation on the opposite side.



Twenty-eight dropsondes were released in the pattern and all but three returned good data.